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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,263	06/23/2003	Michael Kent Cueman	126926	1411

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02/08/2005

General Electric Company
CRD Patent Docket Rm 4A59
Bldg. K-1
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Schenectady, NY 12301

EXAMINER

BENTON, JASON

ART UNIT

PAPER NUMBER

3747

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/602,263	Applicant(s) CUEMAN ET AL. an	
	Examiner Jason Benton	Art Unit 3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/23/03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 6-8, 10-15, and 19-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schmidtke.

The patent by Schmidtke (4,596,210) shows a method of atomization and combustion. A volume of liquid fuel (40) is mixed with a volume of a corresponding soluble gas (20, 22) to create a liquid fuel/dissolved gas mixture. The liquid fuel/dissolved gas mixture is pressurized, and discharged through a discharge opening in fluid communication with a lower pressure chamber forming droplets of the liquid fuel/dissolved gas mixture.

The patent by Schmidtke does not specifically show that the gas emerges from the solution further breaking up the droplets forming smaller droplets. It is the view of the examiner that the gas would inherently separate from the liquid when going from a high pressure area to a lower pressure area.

The dissolved gas and liquid fuel have similar polarity providing mutual solubility with one another.

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The chamber can be a combustion chamber in one of a furnace, cylinder of an internal combustion engine, a combustor for a turbine, or any other device where fuel is burned in air (Fig.s 4-7).

The discharge opening includes a nozzle of a fuel injector (61).

The fuel injector is configured to break the liquid fuel/dissolved gas mixture into droplets.

The discharge opening is disposed in one of a cylinder (68), a manifold, and a combustor (73).

The mixing of the volume of liquid fuel with the volume of the corresponding soluble gas is done when both are under pressure.

The air supply is operatively connected to the chamber. The air supply is configured to flow high pressure air into the chamber to promote the combustion.

A pump (60) is connected to the mixer and the atomization system, to pressurize the mixture and force the mixture downstream to the atomization system.

Claims 3-5 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidtke.

The patent by Schmidtke (4,596,210) does not specifically show that the gas used is one of Nitrous Oxide, Oxygen, Nitrogen, Helium, and Argon. The patent does teach that multiple gases are applicable to the invention (Col.5, lines 42-50). It is the view of the examiner that the specific gas used is a choice of design because no new or unexpected results are achieved.

The liquid fuel can be a diesel fuel (Col. 4, lines 25-39).

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The chamber (62) is a combustion chamber in an internal combustion engine.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidtke.

The patent by Schmidtke does not specify the vehicle that the engine is to be used in. It is the view of the examiner that the type of vehicle the engine is used in is a choice of design because no new or unexpected results are achieved.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidtke.

The patent by Schmidtke (4,596,210) shows an internal combustion engine with a cylinder (63) having a reciprocating piston (not labeled, Fig. 4) operatively connected to a crank (not labeled, Fig. 4) and a combustion chamber (62). A means for injecting a liquid fuel (61) into the combustion chambers of an internal combustion diesel engine is also shown.

A means (11) mixes a volume of the liquid fuel with a volume of a corresponding soluble gas to create a liquid fuel/dissolved gas mixture.

A means (60) pressurizes a resulting liquid fuel/dissolved gas mixture.

A means (61) discharges the liquid fuel/dissolved gas mixture through a discharge opening in fluid communication with each chamber having lower pressure forming droplets of the liquid fuel/dissolved gas mixture.

The patent by Schmidtke does not specify the vehicle that the engine is to be used in is a locomotive. It is the view of the examiner that the type of vehicle the engine is used in is a choice of design because no new or unexpected results are achieved.

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The patent by Schmidtke does not specify that the internal combustion engine has multiple cylinders, it is the view of the examiner that it is an obvious choice of design to provide multiple cylinders in the engine because no new or unexpected results are achieved.

The patent by Schmidtke does not specifically show that the gas emerges from the solution further breaking up the droplets forming smaller droplets. It is the view of the examiner that the gas would inherently separate from the liquid when going from a high pressure area to a lower pressure area.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Benton whose telephone number is (571) 272-4838. The examiner can normally be reached on flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Yuen can be reached on (571) 272-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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JB


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